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10/603,902	06/24/2003	William S. Dworzan	Dworza.W-01	4885

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EXAMINER

GRAHAM, GARY K

ART UNIT PAPER NUMBER

1744

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/461,687

Applicant(s)

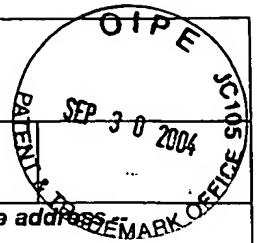
RABIE ET AL.

Examiner

Krishnan S Menon

Art Unit

1723



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address.

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 6-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 6-61 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

Claims 1,3 and 6-61 are pending.

#### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. [09/425,234]: Claims 1,3 and 6-61 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 and 27-38 of copending Application No. 09/425,234. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims recite one or more periodic cleaning steps for membranes with backwashing in which claims differ from one another only in the periodicity of cleaning and/or the strength and nature of the chemical cleaners.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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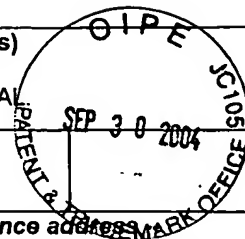
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Examiner

Krishnan S Menon

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This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

2. [10/377,647]: Claims 1,3 and 6-61 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 10/377,647. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims recite one or more periodic cleaning steps for membranes with backwashing in which claims differ from one another only in the periodicity of cleaning and/or the strength and nature of the chemical cleaners.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,3, 6-11,19, 20, 22,23, 25-27,32,35,37-40, 43, 49-51 and 61 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al (US 5,403,479).

Claim 1 recites a method of cleaning membranes immersed in water containing solids in a tank at ambient pressure, the membrane used for producing a permeate inside the membrane; the cleaning steps comprising  
(a) cleaning to increase the permeability of the membrane;

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(b) the event cleanings repeated once or more per week for at least a period of 15 days;

cleaning event comprising flowing a chemical cleaner through the membrane for a period of time to provide the chemical cleaner in or adjacent the membrane;

(c) choosing the concentration and the time such that the cleaning events reduce the rate of decline of the membrane permeability over the at least 15-day period;

step (a) and (b) are in repeated cycles.

Smith teaches membrane immersed in a tank and at ambient pressure: col 2 lines 63-66 and col 1 lines 53-66; event cleaning and recovery cleanings: see (at least) Fig 4: 300 ppm Cl can be recovery cleaning; RO water and/or 150 ppm Cl can be event cleaning; fig 15 is for about 15 days; each of the cleaning steps reduces flux decline and increases flux; uses cleaning chemical (RO water or hypochlorite); event cleaning comprises flowing chemical cleaner through the membrane to provide it adjacent to the membrane: see col 11 lines 22-61. Please note that there is no difference between steps (a) and (b), both steps are for cleaning the membrane.

Claim 3: the membrane permeability decreases over the 15-day period – Smith fig 4.

Claims 6,7,9,11: cleaning chemical is NaOCl at 150 ppm, see col 13 lines 35-40

Claim 8: concentration of the cleaning chemical in the tank is less than 0.5 mg/L (Cleaning chemical not enough to kill more than 20%, ... preferably no more than 5% of the bacteria population is decimated (cleaning chemical completely consumed –

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concentration remaining is zero): abstract; concentration after more than 1000 cleaning cycles so small that permeate quality is not affected: col 11 lines 50-55).

Claim 10: permeate is intended for drinking water – see col 1 lines 32-35 – any poor quality water could be water for use as drinking water after purification. Col 16 lines 6-10: US patent 5,248,424, incorporated by ref, teaches treating ground water, which is used for drinking.

Claims 19, 20, 22, 23, 25: permeate side flushed before permeation is resumed (which is similar to discarding the first collected permeate); first collected permeate after cleaning is not used; tank drained through a drain in the tank; cleaning chemical removed; tank empty: Smith teaches against these in col 11 lines 20-67, particularly lines 50-60. A reference is no less anticipatory if, after disclosing the invention, the reference then disparages it. The question whether a reference “teaches away” from the invention is inapplicable to an anticipation analysis. *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998)

Claim 26, 27: hollow fibers, porosity between 0.003 and 10 microns: col abstract, col 3 lines 16-26, col 10 lines 1-20); length 1-3m: col 16 lines 27-30.

Claim 32: cleaning event is between one and 7 times a week (see col 13 lines 33-60 and the figures). Again, cleaning frequency is optimizable depending the quality and quantity of water and type of membrane. (In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). )



Claim 43: Smith teaches a CT value as defined by this claim – see col 13 lines 33-40.

Claim 35: Smith teaches a method for cleaning an immersed membrane one or more times a week (col 13 lines 33-64) by passing a cleaning chemical through the membrane for a period of time (see abstract). (Please note that the cleaning frequency is a variable that can be optimized depending on the quality and quantity of water to be treated and the type of membrane used. In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). ) Re the limitation of “recovery cleanings” from time to time with the “cleaning events” between such recovery cleanings: Smith teaches various methods of “recovery cleaning” in column 4 line 12- col 11 line 20; which includes back-flushing the membrane with cleaning chemicals (see col 8 line 57- col 9 line 68). Smith also teaches back-flushing with RO water, permeate or lower concentration of CI similar to the “cleaning events” between “recovery cleanings”, which would be the higher concentration CI (see fig 4). Re the limitations of hollow fiber membranes and ambient pressure, see Smith col 16 lines 20-33 and col 2 lines 63-68. Re cleaning to increase the permeability, see Figure 4.

Claim 37: membrane remains immersed and not agitated: col 11 line 63

Claim 38-40 comprises oxidant (NaOCl), chlorine, 20-200 ppm – col 12 line 24, col 13 line 33-40

Claim 49, 50: membrane is hollow fiber (col 1 lines 5-30), porosity – see col 3 lines 18-30); length 1-3m: col 16 lines 20-33.

Claim 51: event cleaning started before permeability drops down to 70% of permeability after last recovery cleaning—Smith's teaching of "recovery cleaning" is when the membrane permeability drops below 70% (abstract), the event cleaning would be before it reaches 70% ( col 9 lines 18-30).

Claim 61: concentration of the cleaning chemical in the tank is less than 0.5 mg/L (insignificant: abstract, col 11 lines 50-55).

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 12-18, 24, 28-31, 33, 34, 36, 41-42, and 52-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (479).

Smith teaches all the limitations of Claim 1, which recites a method of cleaning membranes immersed in water containing solids in a tank at ambient pressure, the membrane used for producing a permeate inside the membrane; the cleaning steps comprising

(a) cleaning to increase the permeability of the membrane;

(b) the event cleanings repeated once or more per week for at least a period of 15 days;

cleaning event comprising flowing a chemical cleaner through the membrane for a period of time to provide the chemical cleaner in or adjacent the membrane;

(c ) choosing the concentration and the time such that the cleaning events reduce the rate of decline of the membrane permeability over the at least 15-day period;

step (a) and (b) are in repeated cycles.

Smith teaches membrane immersed in a tank and at ambient pressure: col 2 lines 63-66 and col 1 lines 53-66; event cleaning and recovery cleanings: see (at least) Fig 4: 300 ppm Cl can be recovery cleaning; RO water and/or 150 ppm Cl can be event cleaning; fig 15 is for about 15 days; each of the cleaning steps reduces flux decline and increases flux; uses cleaning chemical (RO water or hypochlorite); event cleaning comprises flowing chemical cleaner through the membrane to provide it adjacent to the membrane: see col 11 lines 22-61. Please note that there is no difference between steps (a) and (b), both steps are for cleaning the membrane.

Smith also teaches all the limitations of claim 35, as follows: Claim 35: Smith teaches a method for cleaning an immersed membrane one or more times a week (col 13 lines 33-64) by passing a cleaning chemical through the membrane for a period of time (see abstract). (Please note that the cleaning frequency is a variable that can be optimized depending on the quality and quantity of water to be treated and the type of membrane used. In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). ) Re the limitation of "recovery cleanings" from time to time with the

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"cleaning events" between such recovery cleanings: Smith teaches various methods of "recovery cleaning" in column 4 line 12- col 11 line 20; which includes back-flushing the membrane with cleaning chemicals (see col 8 line 57- col 9 line 68). Smith also teaches back-flushing with RO water, permeate or lower concentration of Cl similar to the "cleaning events" between "recovery cleanings", which would be the higher concentration Cl (see fig 4). Re the limitations of hollow fiber membranes and ambient pressure, see Smith col 16 lines 20-33 and col 2 lines 63-68. Re cleaning to increase the permeability, see Figure 4.

Instant claims add further limitations as follows:

Claims 12 – 16: the time duration for treatment, the CT value and the frequency of cleaning are variables that can be optimized depending on the nature of the water treated, quantity of water treated, type of membrane, etc. (In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). )

Claims 17 and 18: membrane remains immersed during cleaning and is not agitated (see abstract and col 11 lines 20-60)

Claim 24: practiced in a batch filtration process – it would be obvious to one of ordinary skill in the art at the time of invention to use this cleaning in a batch filtration process, because it is just a process of cleaning and membrane can get fouled up whether batch or continuous process.

Claim 28: event cleaning started before permeability drops down to 70% of fresh permeability – it would be obvious to one of ordinary skill in the art at the time of

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invention that since the Smith's teaching of "recovery cleaning" is when the membrane permeability drops below 70% (abstract), the event cleaning would be before it reaches 70% ( col 9 lines 18-30).

Claim 29-31: amount of cleaning chemical used would depend on the nature and quantity of water treated and the type and surface area of membrane and can be optimized (In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). ). The membrane is immersed in water (col 11 line 63)

Claims 33,34: cleaning frequency and event dosage selected based on regulatory limitations: optimizable depending on water quality and membrane type (In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955))

Claim 36: recovery cleaning 15 days apart – optimizable, depending on water quality – In re Boesch...

Claims 41-42: time period, CT, etc are optimizable depending on the quality and quantity of water treated and the membrane (In re Boesch...)

Claim 52, 53: cleaning chemical usage is optimizable depending on the water quality, quantity and the membrane (in re Boesch...)

Claim 54: membrane is immersed in water – col 11 line 63

Claims 55-57: cleaning frequency and the dosage are optimizable depending on the water quality and quantity and the membrane type (In re Boesch...)

Claim 58: practiced in a batch filtration process – it would be obvious to one of ordinary skill in the art at the time of invention to use this cleaning in a batch filtration process, because it is just a process of cleaning and membrane can get fouled up whether batch or continuous process.

2. Claims 21, 44-48, 59, and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (479) in view of Kawanishi et al (US (5,647,988).

Claim 21: Smith teaches all the limitations of claim 1 as given in the 102(b) rejection above. Claim 21 depends from claim 1 and adds the further limitation of the cleaning chemical being introduced in the permeate and allowed to flow from the permeate side to the feed side (col 11 lines 20-67 of Smith). Smith does not teach a permeate tank. Kawanishi (see figures) teaches a permeate tank and cleaning solution being injected into the permeate line. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Kawanishi in the teaching of Smith to have a permeate tank because Smith does not teach such a tank and one would need a tank if one decides to store the permeate.

Smith teaches the limitations of claim 35 as given above. Claims 44,45,47 and 48 add further limitations of flushing the membrane with permeate or discarding the first permeate (both steps are equivalent), or removing cleaning chemical from the tank. Smith discourages draining the tank because it is unnecessary. Kawanishi teaches rinsing the filter with permeate (col 2 lines 59-63). Re claims 59 and 60, the steps of draining the tank after cleaning or cleaning with empty tank, and Kawanishi is silent on

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either step. However, Kawanishi teaches rinsing the membrane with filtrate, which requires the tank to be empty of the retentate water, or the membrane to be taken out of the tank. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Kawanishi in the teaching of Smith because this would eliminate any and all of adverse effects of the cleaning chemicals remaining in the system as taught by Kawanishi (col 1 lines 55-64). Claim 46 adds the step of flowing the cleaning chemical is through the permeate (Smith abstract). Smith does not teach a permeate tank. Kawanishi (see figures) teaches a permeate tank and cleaning solution being injected into the permeate line. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Kawanishi in the teaching of Smith to have a permeate tank because Smith does not teach such a tank and one would need a tank if one decides to store the permeate.

### ***Response to Arguments***

Applicant's arguments filed 5/4/04 have been fully considered but they are not persuasive.

In response to applicants' arguments that Smith's teachings does not anticipate claim 1, Smith teaches at least in Fig 4 a process of cleaning the membrane by back-flowing chemical cleaners, in a periodic fashion. Smith teaches various methods of cleaning the membrane as described in the prior arts, and the effect of cyclic cleaning on the membrane in Fig 4. What applicants recite in the claims are step-wise instructions of cleaning the membrane. There is no difference between step (a) and

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step (b), because step a simply states cleaning the membrane to improve permeability, and step (b) recites cleaning events with a cleaning chemical, and step (a) can be the same as step (b). Cleaning the membrane would inherently increase the permeability. The frequency and duration of cleaning steps and the cleaning chemical concentration are variables that depend on the type of the membrane, quality of the feed water and the feed water flow rate, and are optimizable by one of ordinary skill in the art (In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955)).

With regard to the arguments about the rejection of claim 35, that office action does not provide any evidence, please see the rejection. Elements of the claim are adequately related to the specific teachings of the reference. With regard to the argument that Smith teaches that the prior art methods have disadvantages, this argument has no relevance since the rejection is anticipatory, and also Smith provides sufficient teaching to anticipate claim 35. "Recovery cleaning" and "cleaning event" are recited without any actual process step involved, and could mean same or similar steps.

Arguments re the Kawanishi ref: Smith's teaching of draining the tank as unnecessary does not mean that it is a negative teaching. One would be motivated to use the teaching of Kawanishi for his teaching as cited from the reference.

### ***Conclusion***

This action is in response to an RCE, and is made non-final because of the new grounds for rejection including double patenting



Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Krishnan Menon  
Patent Examiner

  
W. L. WALKER  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700